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Diarrhea in Children in Pediatric Hospitals in the Democratic Republic of Congo : Epidemio-Clinical, Therapeutic and Evolutionary Profile

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ABSTRACT

Diarrhea remains a significant cause of pediatric morbidity and mortality in resource-limited countries, particularly in the Democratic Republic of Congo. This study aimed to describe the epidemiological, clinical, therapeutic, and evolutionary profile of diarrhea cases observed in children in Congolese hospitals.

Through a multicenter and descriptive analysis, the records of children admitted to 5 pediatric services across the DRC between 2019 and 2021 were collected.

The results reveal a hospital prevalence of 16.8%. The sex ratio is 1.2. The average age is 3.5 years with 70.3% of children under 5 years. There are two peaks of admissions; from December to January and March to May. Only 52.4% of cases were consulted within the first 48 hours of the onset of diarrhea. Fever, physical asthenia and vomiting are the main complaints associated with diarrhea in 63%, 34% and 26% of cases respectively. Stools were watery in 91.6% of cases. Malaria, sepsis and urinary tract infection are the most frequently mentioned associated hypotheses with respective frequencies of 68%, 18% and 14%. Severe anemia was mentioned in 33% of children with diarrhea. The main treatment was parenteral rehydration in 55%, oral rehydration in 41% and zinc supplementation in 27.5%. Transfusion was performed in 37.6% of children with diarrhea. Other therapies applied were antibiotic therapy in 80%, antimalarial treatment in 64% and antipyretic treatment in 61.5%. The average length of stay was 4 days ± 3. Mortality among children with diarrhea was 5%.

The extent of diarrhea among children in Congolese hospitals remains evident. The observations of this study reveal the need to improve the practices of healthcare workers in the hospital management of diarrhea in children.

KEYWORDS: diarrhea, hospital epidemiology, clinical management, child, DRC

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INTRODUCTION

Diarrhea remains defined as the emission of abnormally liquid, abnormally frequent, abnormally abundant stools often accompanied by significant losses of water and electrolytes. In children, it constitutes a medical emergency when it is not treated quickly, due to the high risk of dehydration and other serious complications associated with it (1).

Globally, diarrhea is one of the leading causes of morbidity and mortality in the pediatric population in general and in children under 5 years of age in particular. Each year, nearly 1.7 billion cases are recorded in pediatrics, resulting in up to

approximately 525,000 child deaths (1,2). It is the second leading cause of death among children after pneumonia. Diarrhea alone kills more children than AIDS, malaria, and measles combined (3). Studies conducted in Africa estimate that the hospital prevalence of diarrhea in children is between 12 and 20% of all admissions with large variations inversely proportional to the age groups of less than 5 years, 5 to 15 years and over 15 years (4,5). In a MICS report cited by Sangaji et al, diarrheal morbidity in the pediatric population in the Democratic Republic of Congo is around 18% and child mortality from diarrhea is 13.5% (6). The country is the third of 15 countries that bear three-quarters of the global burden of childhood diarrhea (3).

To stem the burden of diarrheal diseases, WHO has implemented prevention and treatment strategies that include the role of the hospital environment. The success of these strategies requires ongoing research in each region to test and develop new contextualized strategies for the prevention and control of diarrhea (1,7).

Despite the few initiatives implemented for the prevention and control of diarrhea in children, there are still gaps in compliance with recommendations for management, particularly in hospitals (8).

It is within this framework that the present study is conducted. Its main objective is to analyze the epidemio-clinical, therapeutic and evolutionary profile of diarrhea in children hospitalized in the DRC, in order to contribute to an improvement in the clinical management of diarrhea in children.

METHODOLOGY

This is a multicenter, cross-sectional, and retrospective study conducted on information collected in 5 hospitals in the DRC (University Clinics of Lubumbashi, Kinshasa General Reference Hospital ex-Mama Yemo, Kimbanguiste Hospital of Kinshasa, Makiso General Reference Hospital, and Kindu General Reference Hospital). These hospitals were chosen because they each have a pediatric department that provides general and specialized pediatric care.

The sample consists of all children admitted to pediatrics with a diagnosis of diarrhea between 2019 and 2021. The study data are extracted from the database of the Disease Prevention and Control Unit (UPCM), a research structure within the University of Kindu.

The study variables retained are age, sex, month of admission, type of stool, associated complaints, consultation time, associated pathologies, treatment received, length of stay and discharge modality.

Data analysis was performed using SPSS 25 software. The percentage of observations, mean, standard deviation and median are the calculations performed in univariate analyses.

The standards of ethics in medical research were observed and the exploitation of the data was previously submitted for approval to the Faculty of Medicine of the University of Kindu and to the managers of the UPCM.

RESULTS

We recorded 2,483 child admissions from 2019 to 2021, including 418 cases of diarrhea, or 16.8%. Males are the most represented, with 55.5%. The average age of diarrhea cases is 3.5 years, with 70.3% of children under 5 years old (Table I).

There are two peaks in the admission of diarrhea cases. The first is from December to January and the second from March to May (Figure 1).

Anamnestic information shows that 91.6% of cases presented with watery stools. Consultation was early, within 48 hours of the onset of diarrhea, in 52.4% of children. Fever, physical asthenia and vomiting are the main complaints associated with diarrhea in 63%, 34% and 26% of cases respectively (Table I).

Diagnostic data indicate that 33% of children with diarrhea have severe anemia. Malaria, sepsis, and urinary tract infection are the common pathologies diagnosed in children with diarrhea (Table II).

According to the therapeutic modalities collected, perfusion, oral rehydration and zinc supplementation were administered in 55%, 41% and 27.5% of cases respectively. Nearly 38% of children with diarrhea were transfused. The most applied therapies are antibiotic therapy (79.7%), antimalarial treatment (63.6%) and antipyretic treatment (61.5%).

Regarding the evolution of cases, 5% of cases died. The average length of stay was 4 days ± 3 and 68.4% of cases spent a maximum of 5 days in hospital.

Table I: Sociodemographic, anamnestic and clinical information

Variables	Number (n=418)	Percentage
Age		
2 to 59 months	294	70.3
2 to 5 months	51	12.2
6 to 11 months	73	17.5
12 to 23 months	71	17.0
24 to 35 months	49	11.7
36 to 47 months	34	8.1
48 to 59 months	16	3.8
5 to 10 years	89	21.3

11 to 15 years	32	7.7
16 to 20 years	3	0.7
Gender		
Female	186	44.5
Male	232	55.5
Type of stool		
Watery stools	383	91.6
Bloody stools	26	6.2
Mucus-filled stools	13	3.1
Consultation deadline		
≤ 2 days	219	52.4
3 – 5 days	131	31.3
> 5 days	68	16.3
Related complaints		
Fever	262	62.7
Physical asthenia	144	34.4
Vomiting	109	26.1
Pallor	64	15.3
Abdominal pain	57	13.6
Cough	33	7.9
Anorexia	28	6.7
Agitation	11	2.6
Dyspnea	11	2.6
Seizures	8	1.9

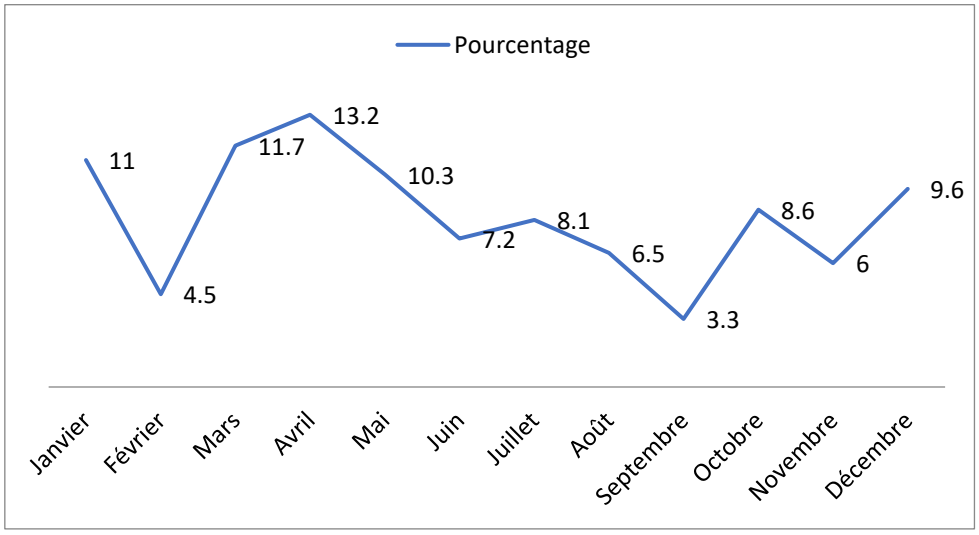

Figure 1: Monthly distribution of diarrhea cases

Table II: Diagnostic, therapeutic and evolutionnary infoirmations

Variables	Number (n=418)	Percentage
Associated diagnoses		
Malaria	283	67.7
Anemia	138	33.0
Sepsis	73	17.5
Urinary tract infection	58	13.9
Respiratory infections	27	6.5
Meningitis	26	6.2
Typhoid fever	24	5.7
ENT infections	21	5.0
Treatment received		

Antibiotic	333	79.7
Antimalarial	266	63.6
Antipyretic	257	61.5
Infusion (hydration)	229	54.8
Vitamin supplement	186	44.5
SRO	173	41.4
Transfusion	157	37.6
Zinc sulfate	115	27.5
Analgesic	59	14.1
Antiemetic	50	12.0
Antifungal	18	4.3
Length of stay		
≤ 5 days	286	68.4
> 5 days	132	31.6
Exit modalities		
Improvement	349	83.5
Death	21	5.0
SCAM	43	10.3
Transfer	5	1.2

DISCUSSION

1. Sociodemographic, anamnestic and clinical data

During the study period, we recorded 418 cases of diarrhea in the pediatric hospital environment, or 16.8% of the 2,418 children admitted. This result is not far from the national average contained in the MICS-RDC report, which is 18% (6). A result close to ours was found by EL BOURADI in the Algerian pediatric hospital environment in 2019 with 16.5% (9). It appears that the extent of diarrhea in children has remained unchanged in recent years; this can be explained by its etiological diversity and its determinants (3,10). It is necessary that studies continue to be carried out to lead to an optimization of hospital care.

In our study, the average age of children with diarrhea was 3.5 years, with a predominance of children under 5 years, who represent 70.3% of cases. This observation corroborates those of the WHO and other authors who show that children under 5 years are the most affected by diarrheal diseases (1,4,5,11,12). Among the reasons for this age-related predisposition are :

- An immature immune system predisposes to infections that cause diarrhea,
- Improper dietary diversification in a maturing digestive system.

The male sex is predominant over the female sex (55.5% vs. 44.5%) in our series. This trend was found separately by Sanou (11), Togo (12), Atokare (13) and Fischer (14). Sangaji made a contrary observation with a predominance of the female sex in his series which dealt with rotavirus diarrhea and this without statistical significance (6). For Atokare and Fischer, the predominance of the male sex among children with diarrhea would be due to an immunogenetic predisposition especially for diarrhea of infectious origin (13,14).

Our study reports 91.6% of diarrhea cases with watery stools. The appearance of stools has a triple interest in the management of diarrhea in children. These are the interest in etiological orientation, therapeutic attitude and immediate prognosis. Watery diarrhea, except for cholera, is often associated with viral, parenteral and alimentary etiologies (15). Their initial treatment essentially prioritizes rehydration as well as zinc sulfate supplementation (8,15). They have a good immediate prognosis as long as dehydration has been avoided. The studies of Sanou, Togo and Sidibé also reveal that more than ¾ of children's diarrheas were watery (11,12,16). Our results help guide strategies to be defined in the prevention and control of diarrhea in children at the national level, both at community and hospital levels.

In our study, only 52.4% of children with diarrhea were seen for consultation within the first 48 hours of the onset of diarrhea. There is still work to be done to raise awareness among parents in order to reduce the time it takes for children with diarrhea to seek medical attention. Delayed consultation during diarrhea is a factor of poor prognosis for the child.

We found that fever, physical asthenia and vomiting are the main complaints associated with diarrhea in the order of 63%, 34% and 26% of cases respectively. This observation corroborates those of many other authors (11,12,16). Fever would be more associated with diarrhea because of the predominant febrile infectious origin in childhood diarrhea. Asthenia would be an indicator of dehydration.

2. Monthly variation in cases of children with diarrhea

Our results show two peaks in admission of diarrhea cases, namely from December to January and from March to May. Previous studies have confirmed the seasonality of the frequency of diarrheal diseases in children (10,17). Also, the prevalence of causes of diarrhea varies with the seasons

(12,18–20). In tropical areas, for example, infectious diarrhea of viral origin has a peak incidence during the cold and dry season, while that of bacterial origin has its peak during the hot and rainy season (12). Justifying the seasonality of diarrhea in a setting requires consideration of many other associated factors that were not the subject of our study. Seasonality analysis allows for planning the needs necessary for the effective management of an outbreak of diarrhea cases in children in a hospital setting.

3. Diagnostic, therapeutic and evolutionnary infoirmations

Our study reveals that 33% of children with diarrhea have severe anemia. Malaria, sepsis, and urinary tract infection are the most frequently mentioned diarrhea-associated pathologies, with respective frequencies of 68%, 18%, and 14%. These results suggest a predominance of parenteral diarrhea in our setting. This hypothesis would be justified by the epidemiological transition of diarrheal diseases in children since the introduction of rotavirus and cholera vaccines. All this could only be confirmed with a study that includes stool examination among the variables in order to make an objective judgment.

In our series, the systematic therapy for diarrhea was made up of parenteral rehydration in 55%, oral rehydration in 41% and zinc supplementation in 27.5%. Nearly 38% of children with diarrhea were transfused. Other therapies applied in children with diarrhea are antibiotic therapy in 80%, antimalarial treatment in 64% and antipyretic treatment in 61.5%. Our observation shows a low compliance with the joint recommendations of WHO and UNICEF regarding clinical management of diarrhea in children where rehydration and zinc supplementation are recommended for all children with diarrhea while the use of antibiotic therapy is intended to be selective and restrictive (8,19). This observed gap in attitudes raises interest in increasing awareness and ongoing training of healthcare staff on these recommendations for better hospital management of childhood diarrhea.

This study showed that the average length of stay was 4 days ± 3 and 68.4% of cases spent a maximum of 5 days in hospital. Mortality was 5% among the children with diarrhea recorded in the study. Our results differ, by superiority, from those found by El Bouradi and Rébeillé-Borgella who reported hospitalization durations of less than 2 days in their respective series (9,21). El Bouradi also reported a mortality rate of less than 1% in his series. Our results could be explained by two observations made during the study :

- The long consultation deadline for a significant proportion of children with diarrhea
- The low proportion of children rehydrated and supplemented with zinc sulfate.

CONCLUSION

The extent of diarrhea in children in Congolese hospitals remains evident compared to data from recent years. Children under 5 years of age are the most represented among those with diarrhea. Watery diarrhea is dominant. Many children with diarrhea seek medical attention. Hospital care for the majority of children is still far from current recommendations. The evolution of children with diarrhea is not optimal. These observations reveal the need to conduct numerous clinical studies on this scourge and improve the practices of healthcare personnel regarding the hospital management of diarrhea in children.

CONFLICTS OF INTEREST

There are no conflicts of interest declared by the authors of this study.

AUTHORS' CONTRIBUTION

Baruani I.I literature review and writing. Amuri K.P writing. Abdala K.A design, collection, analysis and writing. Shindano M.E supervision of all stages of the study. All authors acknowledge having reviewed and approved the final version.

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